

ATTACHMENT B
Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

1) (Currently Amended) Equipment for preparing for electrostatic painting three-dimensional articles with a predominantly flat extension, made from dielectric or low-conductivity material, said equipment comprising:

a horizontal conveyor made from an electrically insulating material, having a resistivity greater than that of the articles to be painted; and

one or more electrodes placed in isolated positions, at suitable distances from each other and from the edges of the articles, under the articles, at least while powdered paints electrostatically charged to an electrical potential are being fed on to them, said one or more electrodes emitting an electrical field with characteristics such that the electric field charges the whole visible surface of the articles, as far as their area of contact with the horizontal conveyor, to an electrical potential of opposite sign to that of the powdered paints, in such a way that the powdered paints completely and uniformly cover the visible surface of the articles,

said one or more electrodes being of any suitable shape for their intended purpose and positioned under an upper run of the horizontal conveyor, the thickness of the horizontal conveyor being reduced in order to cause the least possible attenuation of the electrical field generated by said one or more electrodes which are located at least near one or more painting units and can be connected selectively to an electrical

generator through at least one switching unit, in such a way that ~~they~~ the one or more painting units can be activated selectively, at least in accordance with the dimensions in plan view of the articles to be painted.

- 2) (Previously Presented) The equipment according to claim 1, wherein said horizontal conveyor is made from a sufficiently porous material, permeable to air but not to paint powders.
- 3) (Previously Presented) The equipment according to claim 2, further comprising suction means to collect and remove dust from a lower return run of the horizontal conveyor which may be displaced by a jet of pressurized air which passes through said return run.
- 4) (Previously Presented) The equipment according to claim 1, wherein at least a part of said horizontal conveyor in contact with the articles to be painted is made from a material whose resistivity is greater by at least one order of magnitude than that of the articles.
- 5) (Previously Presented) The equipment according to claim 4, wherein said horizontal conveyor comprises a belt comprising polyethylene.
- 6) (Currently Amended) The equipment according to claim 1, wherein the one or more electrodes for polarizing the articles to be painted is located at a distance from the

edge of the articles which is greater than 0.5 to 4 times the height of the edge of the articles to be painted.

7) (Currently Amended) The equipment according to claim 1, wherein the ~~electrode~~ one or more electrodes for polarizing the articles to be painted is located at a distance from the edge of the articles which is not more than 5 to 20 times the height of the edge of the articles.

8) (Previously Presented) The equipment according to claim 1, wherein when the shape of the articles is such that the articles have to be acted on by a plurality of said one or more electrodes, the distance between the plurality of electrodes is not less than 5 to 20 times the height of the edge of the articles.

9) (Currently Amended) The equipment according to claim 1, wherein the one or more electrodes ~~are of any suitable shape for their intended purpose,~~ are fixed with a precise distribution to the conveyor so that they are as close as possible to or directly in contact with the articles to be painted, and are connected, by means of extensions or by means of electrical conductors connected to them, to corresponding fixed contacts connected to a lower face and/or to the edges of the horizontal conveyor, where said contacts are distributed in rows for interaction with power supply collectors which are supplied selectively, according to the dimensions of the articles to be painted, by at least one of the at least one switching-unit units connected to an electrical generator.

10) (Previously Presented) The equipment according to claim 9, wherein said collectors and the switching and power supply units are fixed.

11) (Previously Presented) The equipment according to claim 9, wherein said collectors are movable with forward and return reciprocating movements in the direction of the movement of the articles to be painted.

12) (Canceled)

13) (Previously Presented) The equipment according to claim 1, wherein the one or more electrodes are mounted on motorized sliders by means of which their position can be adjusted in space, for better adaptation to the dimensions in plan view of the articles to be painted.

14) (Previously Presented) The equipment according to claim 1, wherein the one or more electrodes are fixed.

15) (Previously Presented) The equipment according to claim 1, wherein the one or more electrodes are mounted on structures by means of which said one or more electrodes can be given a cyclical forward and return movement in the direction of the movement of the articles to be painted.

16) (Previously Presented) The equipment according to claim 15, wherein said means of movement are means of reciprocating rectilinear movement.

17) (Currently Amended) The equipment according to claim 15, wherein said means of movement are means of continuous movement of a closed conveyor and the one or more electrodes are connected to ~~a switching and power supply source~~ one of the at least one switching units and the electrode generator by means of collectors having a sliding contact.

18) (Currently Amended) The equipment according to claim 1, wherein means are provided for controlling the operation of the one or more electrodes in accordance with the dimensions and the positioning in space of the articles to be painted and these means comprise one of the at least one switching units connected to the electrical generator and controlled by a processor which receives information on the dimensions of the articles from optoelectronic means located up-line from a paint chamber and which receives from an encoder information on the speed of advance of the horizontal conveyor, said means being provided to enable said processor to operate with access to the information on the position in space of any moment of the articles to be painted.

19) (Previously Presented) The equipment according to claim 1, wherein said horizontal conveyor comprises a conveyor belt having a thickness which is restricted as much as possible and being in the range from 0.5 to 3 mm.

20) (Previously Presented) The equipment according to claim 19, wherein said conveyor belt comprises a polyester fabric core, impregnated with polyurethane material, and coated at least on its upper face with polyurethane material, in such a way that it has a perfectly smooth outer surface which is suitable for cleaning with mechanical and pneumatic means which operate on a return run of the conveyor belt.

21) (Previously Presented) The equipment according to claim 20, wherein the polyurethane coating is approximately 0.2 mm thick.

22) (Previously Presented) The equipment according to claim 19, wherein said conveyor belt comprises an upper run which slides on and is supported by a flat horizontal bed supported by a frame of said equipment, said bed comprised of an electrically insulating material, which has a resistivity greater than that of the articles to be painted and which is coated on the face in contact with said conveyor belt with at least one sheet of the same material as that of the conveyor belt.

23) (Previously Presented) The equipment according to claim 19, wherein said one or more electrodes are mounted at equal distances from each other and in such a way that they can be activated and de-activated, on one or more rectilinear closed conveyors, said rectilinear conveyors made from electrically insulating material, positioned longitudinally under an upper run of said conveyor belt move in the same direction and at the same speed as said horizontal conveyor, and have a length such that they follow the articles positioned above them throughout a painting cycle.

24) (Previously Presented) The equipment according to claim 23, wherein said one or more rectilinear conveyors takes its motion from a transmission system which also drives said belt of said horizontal conveyor.

25) (Previously Presented) The equipment according to claim 22, further comprising a bed supporting the upper run of said horizontal conveyor, said bed having at least one longitudinal aperture which leaves free the portion of the said horizontal conveyor on which the one or more electrodes for polarizing the articles to be painted can act by contact.

26) (Currently Amended) The equipment according to claim 22, wherein said further comprising one or more rectilinear conveyors- which carry said one or more electrodes, said one or more rectilinear conveyors is formed from a chain of links of electrically insulating material, which carry, at constant intervals, projecting appendages made from electrically insulating material, on which are pivoted, by their forked ends, metal levers each of which carries integrally and transversely on its other end, a metal head which forms the actual electrode for polarizing the articles, said metal levers being pivoted on said supporting appendages by means of a freely rotatably metal pin which has at one end a small lever which terminates in a rounded end and which is constantly orientated downwards by gravity or by the action of suitable means and which while travelling along the upper run of one of the one or more rectilinear conveyor conveyors in

question, slides on a linear metal collector connected to said electrical generator for the necessary polarization of the one or more electrodes.

27) (Previously Presented) The equipment according to claim 23, wherein said one or more electrodes attached to said one or more rectilinear conveyors are spaced apart from each other on the order of 10 to 20 cm.

28) (Previously Presented) The equipment according to claim 26, wherein said metal head is formed from a length of tubular section with a rectangular cross section, orientated in such a way that, as it travels along the upper run of said one or more rectilinear conveyors, if the electrode is to be in the high active position, said metal head uniformly touches a lower face of said horizontal conveyor with one of its larger faces.

29) (Previously Presented) The equipment according to claim 26, wherein said one or more electrodes have approximately the following dimensions: 20 x 10 x 65 mm.

30) (Currently Amended) The equipment according to claim 26, further comprising under the lower run of said one or more rectilinear conveyors and parallel to it, a fixed guide, made from electrically insulating material at least in its upper part and having a curved initial portion for collecting said one or more electrodes leaving the upper run of one of the corresponding conveyor one or more rectilinear conveyors, said fixed guide having the function of preventing said one or more electrodes from oscillating in an unnecessary and dangerous way along the return path, and positioning said one or

more electrodes correctly for interaction with a metal brush connected to ground for eliminating any residual voltage on said one or more electrodes before their return to the upper run of said one or more rectilinear conveyors.

31) (Previously Presented) The equipment according to claim 26, wherein said one or more electrodes carry on at least one end an integral skid made from electrically insulating material and with a low coefficient of friction, which, during the movement of said one or more electrodes, interacts with guide means which place said one or more electrodes correctly in the active or passive position in which they contact or do not contact the upper run of said horizontal conveyor.

32) (Currently Amended) The equipment according to claim 26, further comprising a fixed cam in the form of a sector of a circle and coaxially with a return shaft of said one or more conveyors, said fixed cam interacting with an end skid of said one or more electrodes which, as a result of this interaction, are kept away from said links, to ensure that said links have a freedom of relative movement on ~~the~~ a curved path around said return shaft.

33) (Currently Amended) The equipment according to claim 26, further comprising an inclined plane cam located proximate start of the upper run of said one or more rectilinear conveyors, said inclined plane cam being transferable by an actuator from a high position to a low position at the command of a processor which controls operation of said equipment, said processor acting on the basis of the data received from an

optoelectronic barrier which detects the dimensions of the articles to be painted on entry into a painting machine said equipment and on the basis of data received from a sensor which detects the phase of the one or more electrodes, decides whether said one or more electrodes cyclically reaching the upper position are to be activated or not, and therefore whether said inclined plane cam is to be in the high or low position respectively.

34) (Currently Amended) The equipment according to claim 33, wherein said start of the upper run is suitably tapered to form a lead-in, of a first linear guide and provided down-line from a movable inclined plane cam when the latter is in a high position, said linear guide being fixed to the frame of ~~the conveyor in question~~ one of the one or more rectilinear conveyors, parallel to one of the one or more rectilinear conveyors conveyor, end skids of said one or more electrodes rising on to and sliding along said guide and thus being raised and kept in contact with said horizontal conveyor, a second fixed guide having a low coefficient of friction, being provided opposite said first linear guide and parallel thereto, the other ends of said one or more electrodes sliding and bearing directly, or with the interposition of an additional skid, on said second guide, and thus advancing with a uniformly distributed and constant contact with said horizontal conveyor above them.

35) (Previously Presented) The equipment according to claim 33, wherein if the said inclined plane cam is in the low position, said one or more electrodes advance in the

low position, each in contact with a link of the corresponding one of said rectilinear conveyors, in a position suitably distant from said horizontal conveyor.

36) (Currently Amended) The equipment according to claim 26, further comprising pivot pins of said metal levers carrying said one or more electrodes and carrying at their ends the small levers for making contact with the linear collector for polarizing said one or more electrodes, are axially movable and each is provided, at the opposite end from the small levers with a head, and means are provided for changing the position in space of these pins, to ensure that only the small levers of each electrode which is to be in ~~the~~ a high active position touches said collector, while the levers of each electrode in ~~the~~ a low and inactive position follows a path to one side of and distant from the said collector, so that the corresponding electrodes are not polarized.

37) (Currently Amended) The equipment according to claim 36, wherein before leaving the lower run of one of said rectilinear conveyor, the small levers of each pivot pin of said one or more electrodes which has previously left a stage of interaction with said collector interacts with a linear fixed cam made from electrically insulating material, which forces said pivot pin to move axially so that the small levers are brought closer to said projecting ~~appendage~~ appendages, in such a way that all the small levers which are leaving the lower run of one of said rectilinear conveyors and which are about to rise to the upper run are positioned on the links of this conveyor and consequently to one side of and distant from the position in space occupied by said collector.

38) (Previously Presented) The equipment according to claim 37, further comprising, at the start of the upper run of said one or more rectilinear conveyors, an exchange device which, at the command of a processor, moves axially the pivot pins of only those one or more electrodes which are to remain in the high active position, in such a way that the small levers of these pins move along a trajectory of interaction with the collector.

39) (Currently Amended) The equipment according to claim 38, wherein said exchange device comprises a right-angled lever pivoted on a vertical axis and connected to an oscillation actuator which, when commanded, can move said right-angled lever from the ~~resting~~ inactive position, in which it does not interfere with the pivot pins of the one or more electrodes, to the active position in which one arm of said right-angled lever is inclined so that it interferes with the heads of said pins, to subject them to the axial movement which causes the corresponding small lever to interact with the collector of the one or more electrodes.

40) (Previously Presented) The equipment according to claim 19, wherein said one or more electrodes for polarizing the articles to be painted are fixed on a bed which supports the upper run of the horizontal conveyor and are positioned at isolated points located one after the other in at least one row whose length is suitably greater than the length of a paint chamber and which is orientated along the longitudinal axis of said chamber.

41) (Previously Presented) The equipment according to claim 40, wherein a row of one or more electrodes can be positioned with a slight inclination in the range from 0° to 15° with respect to the longitudinal axis of the horizontal conveyor, in such a way that said one or more electrodes are arranged progressively in different positions with respect to the edges of the articles to be painted, to ensure that the articles are correctly and uniformly covered with paint.

42) (Currently Amended) The equipment according to claim 40, wherein said one or more electrodes can be positioned in different ways on the vertices of a broken line which forms an alternating wave, with the horizontal axes suitably inclined with respect to the longitudinal axis of the horizontal conveyor, in such a way that said one or more electrodes are also widely distributed over the width of said horizontal conveyor for advancing the articles to be painted.

43) (Previously Presented) The equipment according to claim 40, wherein said one or more electrodes are suitably spaced apart from each other by distances of approximately 5 to 20 times the height of the edges of the articles to be painted.

44) (Previously Presented) The equipment according to claim 40, wherein said one or more electrodes can be made in the form of screws with flat countersunk heads, with hexagonal sockets, and with shanks of suitable diameter.

45) (Previously Presented) The equipment according to claim 44, wherein said screws are fixed in holes formed in said bed above which the upper run of the horizontal conveyor slides, in such a way that the flat faces of their heads are coplanar with the upper face of said bed.

46) (Previously Presented) The equipment according to claim 44, wherein said screws are fixed in holes formed in the bed and in a corresponding upper cover above which the upper run of the horizontal conveyor slides, in such a way that the flat faces of their heads are essentially in contact with the said horizontal conveyor for advancing the articles.

47) (Previously Presented) The equipment according to claim 40, further comprising means for ensuring that the one or more electrodes of each row are all constantly connected to a polarization generator.

48) (Previously Presented) The equipment according to claim 40, further comprising means for modulating the activation and inactivation of the one or more electrodes of each row in accordance with the variations of the positions above them of the articles to be painted, which moves continuously, in such a way that said one or more electrodes, in the active phase, are never active at critical distances or too close to the edges of the articles.

49) (Currently Amended) The equipment according to claim 48, wherein said one or more electrodes can be connected to a polarization source through ~~a one of the at least one switching-unit units~~ controlled by a processor unit which receives from an optoelectronic barrier and from an encoder data relating to the dimensions and speed and consequently to the position in space of the articles to be painted.

50) (Previously Presented) The equipment according to claim 49, wherein said switching unit comprises static electric switches.

51) (Currently Amended) The equipment according to claim 49, wherein said switching unit comprises dynamic switches comprising small cylinder and piston units, located under screws forming said one or more electrodes, having their rods aligned and orientated against said screws and holding, with the interposition of an insulating support, an electrical contact connected to said polarization-unit source.

52) (Previously Presented) The equipment according to claim 40, wherein a terminal part of the horizontal conveyor has a downward inclination and continues to be supported by a bed while there is provided above said downward inclination, a wedge-shaped conveyor whose upper run is coplanar with and immediately consecutive to the horizontal run of said horizontal conveyor and advances in such a direction and at such a speed that it collects and removes the painted articles.

53) (Previously Presented) The equipment according to claim 52, further comprising means to clean paint from said wedge-shaped conveyor.

54) (Previously Presented) The equipment according to claim 1, further comprising a polarization generator for generating a continuous voltage which can vary from 0 to 100 kV, and with a current measurable in microamperes.

55) (Previously Presented) The equipment according to claim 19, further comprising automatic means to keep said conveyor belt correctly centered and guided on corresponding return rollers.

56) (Currently Amended) The equipment according to claim 55, wherein a driven end of said conveyor belt runs over a pair of parallel static rollers, one of said pair above the other, supported rotatably by a fixed frame of said equipment, and over a third roller which forces said conveyor belt to form a re-entrant bend and which is located between the said pair of parallel rollers or after said third roller and is parallel to these, but is mounted rotatably at each end on the intermediate part of a corresponding lever, one end of which is pivoted on the said fixed frame, and the other end of which is connected to an oscillation actuator connected to an operating circuit with the interposition of a unit having a feeler which senses the position in space of the side of the conveyor belt adjacent to said lever, the whole system being designed in such a way that if the conveyor belt moves outwards and causes said feeler to be bent outwards, the unit switches and causes the temporary retraction of the a rod of said oscillation actuator

through a predetermined distance which returns the conveyor belt to its track, causing a reduction of the force on said feeler and the switching back of said unit which returns the oscillation actuator to the resting position.

57) (Currently Amended) The equipment according to claim 23, wherein, if said conveyor belt has a width such that it can accommodate articles which may be of considerable width, where movable electrodes are used, a plurality of said rectilinear conveyors with corresponding one or more electrodes can be positioned side by side and in a parallel arrangement under the upper run of said horizontal conveyor, with a distance between the electrodes of one said rectilinear conveyor and those of the neighboring one of said rectilinear conveyors which is not less than that between the electrodes of each said rectilinear conveyors, and/or with the one or more electrodes of one said rectilinear conveyor staggered ~~if necessary~~ with respect to those of the neighboring rectilinear conveyor, and means are provided for selectively activating said rectilinear conveyors and/or the corresponding movable electrodes in accordance with the dimensions of the articles to be painted.

58) (Previously Presented) The equipment according to claim 40, wherein, if said conveyor belt has a width such that it can accommodate articles which may be of considerable width, where fixed electrodes are used, a plurality of rows of the one or more electrodes can be positioned side by side, with a distance between the electrodes of one row and those of the neighboring row not less than that between the one or more electrodes of each row, and/or with the one or more electrodes of one row staggered if

necessary with respect to those of the adjacent row, and means are provided for selectively activating the rows of fixed one or more electrodes in accordance with the dimensions of the articles to be painted.

59) (Previously Presented) Equipment for preparing for electrostatic painting three-dimensional articles with a predominantly flat extension, made from dielectric or low-conductivity material, said equipment comprising:

 a horizontal conveyor made from an electrically insulating material, having a resistivity greater than that of the articles to be painted; and

 one or more electrodes placed in isolated positions, at suitable distances from each other and from the edges of the articles, under the articles, at least while powdered paints electrostatically charged to an electrical potential are being fed on to them, said one or more electrodes emitting an electrical field with characteristics such that the electric field charges the whole visible surface of the articles, as far as their area of contact with the horizontal conveyor, to an electrical potential of opposite sign to that of the powdered paints, in such a way that the powdered paints completely and uniformly cover the visible surface of the articles,

 wherein the one or more electrodes are of any suitable shape for their intended purpose, are fixed with a precise distribution to the horizontal conveyor so that they are as close as possible to or directly in contact with the articles to be painted, and are connected, by means of extensions or by means of electrical conductors connected to them, to corresponding fixed contacts connected to a lower face and/or to the edges of the horizontal conveyor, where said contacts are distributed in rows for interaction with

power supply collectors which are supplied selectively, according to the dimensions of the articles to be painted, by at least one switching unit connected to an electrical generator.

60) (Currently Amended) Equipment for preparing for electrostatic painting three-dimensional articles with a predominantly flat extension, made from dielectric or low-conductivity material, said equipment comprising:

a horizontal conveyor made from an electrically insulating material, having a resistivity greater than that of the articles to be painted, said horizontal conveyor having a thickness which is restricted as much as possible and is in the range from 0.5 to 3 mm, said conveyor comprising a conveyor belt comprising a polyester fabric core, impregnated with polyurethane material, and coated at least on its upper face with polyurethane material, in such a way that it has a perfectly smooth outer surface which is suitable for cleaning with mechanical and pneumatic means which operate on a return run of the belt; and

one or more electrodes placed in isolated positions, at suitable distances from each other and from the edges of the articles, under the articles, at least while powdered paints electrostatically charged to an electrical potential are being fed on to them, said one or more electrodes emitting an electrical field with characteristics such that the electric field charges the whole visible surface of the articles, as far as their area of contact with the horizontal conveyor, to an electrical potential of opposite sign to that of the powdered paints, in such a way that the powdered paints completely and uniformly cover the visible surface of the articles.

61) (Previously Presented) Equipment for preparing for electrostatic painting three-dimensional articles with a predominantly flat extension, made from dielectric or low-conductivity material, said equipment comprising:

a horizontal conveyor made from an electrically insulating material, having a resistivity greater than that of the articles to be painted, said horizontal conveyor having a thickness which is restricted as much as possible and is in the range from 0.5 to 3 mm, said conveyor comprising a conveyor belt comprising an upper run which slides on and is supported by a flat horizontal bed supported by a frame of said equipment, said bed comprised of an electrically insulating material, which has a resistivity greater than that of the articles and which is coated on the face in contact with said conveyor belt with at least one sheet of the same material as that of the belt; and

one or more electrodes placed in isolated positions, at suitable distances from each other and from the edges of the articles, under the articles, at least while powdered paints electrostatically charged to an electrical potential are being fed on to them, said one or more electrodes emitting an electrical field with characteristics such that the electric field charges the whole visible surface of said articles, as far as their area of contact with the conveyor, to an electrical potential of opposite sign to that of the powdered paints, in such a way that the powdered paints completely and uniformly cover the visible surface of the articles.

62) (Previously Presented) Equipment for preparing for electrostatic painting three-dimensional articles with a predominantly flat extension, made from dielectric or low-conductivity material, said equipment comprising:

 a horizontal conveyor made from an electrically insulating material, having a resistivity greater than that of the articles to be painted, said horizontal conveyor having a thickness which is restricted as much as possible and being in the range from 0.5 to 3 mm; and

 one or more electrodes placed in isolated positions, at suitable distances from each other and from the edges of the articles, under the articles, at least while powdered paints electrostatically charged to an electrical potential are being fed on to them, said one or more electrodes emitting an electrical field with characteristics such that the electric field charges the whole visible surface of said articles, as far as their area of contact with the conveyor, to an electrical potential of opposite sign to that of the powdered paints, in such a way that the powdered paints completely and uniformly cover the visible surface of the articles, said one or more electrodes are mounted at equal distances from each other and in such a way that they can be activated and de-activated, on one or more rectilinear closed conveyors, said rectilinear conveyors comprising electrically insulating material, positioned longitudinally under an upper run of a belt of said horizontal conveyor, move in the same direction and at the same speed as said horizontal conveyor, and have a length such that they follow the articles positioned above them throughout a painting cycle.

63) (Previously Presented) Equipment for preparing for electrostatic painting three-dimensional articles with a predominantly flat extension, made from dielectric or low-conductivity material, said equipment comprising:

 a horizontal conveyor made from an electrically insulating material, having a resistivity greater than that of the articles to be painted, said horizontal conveyor having a thickness which is restricted as much as possible and being in the range from 0.5 to 3 mm; and

 one or more electrodes placed in isolated positions, at suitable distances from each other and from the edges of the articles, under the articles, at least while powdered paints electrostatically charged to an electrical potential are being fed on to them, said one or more electrodes emitting an electrical field with characteristics such that the electric field charges the whole visible surface of said articles, as far as their area of contact with the conveyor, to an electrical potential of opposite sign to that of the powdered paints, in such a way that the powdered paints completely and uniformly cover the visible surface of the articles, said one or more electrodes for polarizing the articles to be painted are fixed on a bed which supports the upper run of the horizontal conveyor and are positioned at isolated points located one after the other in at least one row whose length is suitably greater than the length of a paint chamber and which is orientated along the longitudinal axis of said chamber.